

Attorney Docket No. 039153-0529 (G1234)

THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Ercan Adem

Title: METHOD OF ULTRA-LOW ENERGY
ION IMPLANTATION TO FORM
ALLOY LAYERS IN COPPER

Appl. No.: 10/803,852

Filing Date: 3/18/2004

Examiner: Gurley, Lynne Ann

Art Unit: 2812

| |
|--|
| CERTIFICATE OF FACSIMILE TRANSMISSION I hereby certify that this paper is being facsimile transmitted to the United States Patent and Trademark Office, Alexandria, Virginia on the date below. Paul S. Hunter (Printed Name) (Signature) MARCH 1, 2006 (Date of Deposit) |
|--|

DECLARATION UNDER 37 C.F.R. 1.131Commissioner for Patents and Trademarks
Washington, D.C. 20231

Dear Examiner Gurley:

I, ERCAN ADEM state and declare that:

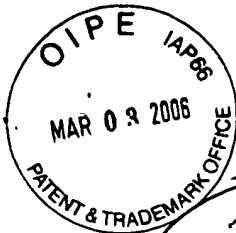
1. I am the inventor of the invention recited in claims 1, 3, and 5-19 of the patent application identified above and am an employee of Advanced Micro Devices, Inc., the Assignee of the patent application.
2. On or before August 21, 2001, I conceived in the United States the subject matter of Claims 1, 3, and 5-19 as evidenced by the attached Exhibit A.
3. Exhibit A (5 pages), titled "AMD INVENTION DISCLOSURE," marked "G1234," is a copy of an invention disclosure document used in the routine business practice of Advanced Micro Devices, Inc. for disclosing inventive subject matter to corporate patent counsel.
4. Exhibit A, received by AMD's Tech. Law Department on August 21, 2001, discloses the base subject matter of Claims 1, 3, and 5-19. Exhibit A was completed during a patent harvesting session dated August 21, 2001.
5. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date:

2/28/2006

By:

ERCAN ADEM



TUESDAY, AUGUST 21, 2001
 COPPER ALLOY PATENT HARVESTING SESSION
 GROUP 2: ROOM C-9 & 10
 Technical Leader: Steve Avanzino
 TOPIC: INTEGRATION

PRIORITY
 A ___ B ☒
 C ___ D ___

230

AMD INVENTION DISCLOSURE

TLD ID# G1234

Rec'd date _____

Sunnyvale x42110, return to MS68,

Texas x55964 return to MS562

Project: ☐, Product: ☐, Process: ☒, Technology ☐, to which the invention applies (identify):

List 2 to 5 key words useful to search by to find patents or art related to this invention:

IDE# 3a

Working title of invention: Use Ultra Low Ion Implantation (ULEII) To Form Alloy Layers in Copper.

→INVENTOR/SESSION PARTICIPANT ADDRESS INFORMATION IS ON THE NEXT PAGE (IA)←

Inventor's signature: _____ date: _____
 Inventor's printed full name: _____ Citizenship: _____
 Employee #: _____ Extension: _____ Mail stop: _____ Home telephone: () _____
 Division: _____ Directorate: _____ Dept #: _____ Dept: _____ Manager: _____
 Residence address: _____
 Post Office address: _____

Co-Inventor's signature: _____ date: _____
 Co-Inventor's printed full name: _____ Citizenship: _____
 Employee #: _____ Extension: _____ Mail stop: _____ Home telephone: () _____
 Division: _____ Directorate: _____ Dept #: _____ Dept: _____ Manager: _____
 Residence address: _____
 Post Office address: _____

Co-Inventor's signature: _____ date: _____
 Co-Inventor's printed full name: _____ Citizenship: _____
 Employee #: _____ Extension: _____ Mail stop: _____ Home telephone: () _____
 Division: _____ Directorate: _____ Dept #: _____ Dept: _____ Manager: _____
 Residence address: _____
 Post Office address: _____

Co-Inventor's signature: _____ date: _____
 Co-Inventor's printed full name: _____ Citizenship: _____
 Employee #: _____ Extension: _____ Mail stop: _____ Home telephone: () _____
 Division: _____ Directorate: _____ Dept #: _____ Dept: _____ Manager: _____
 Residence address: _____
 Post Office address: _____

List on additional sheet if there are more co-inventors and list total number of inventors here: _____
 Name(s) of attorney(s) preferred by inventor(s) to prepare patent application, if known:

LAW FIRM: FOLEY & LARDNER
 ATTORNEYS: Ron Coslick and Rick Malone
DAVID BLUMENFELD

Witness 1 initial: _____ Witness 2 initial: _____

PARTICIPANT ADDRESSES
Tuesday, August 21, 2001—ROOMS C-9&10

| Name | Citizenship | Employee # | Dept. # | Mail Stop | Work # | Fax # | Address | City | State | Zip Code |
|--|----------------|------------|---------|-----------|--------------|--------------|----------------------|---------------|-------|----------|
| Adem, Ercan Ercan.Adem@amd.com | UNITED KINGDOM | 022538 | 07370 | 32 | 408/749-4820 | 408/774-8812 | 729 Liverpool Way | Sunnyvale | CA | 94087 |
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| Erb, Darrell M. Darrell.Erb@amd.com | USA | 007140 | 07881 | 79 | 408/749-4312 | 408/749-3851 | 1100 Runnymead Drive | Los Altos | CA | 94024 |
| MacDonald, Brian J. Brian.MacDonald@amd.com | USA | 022733 | 07370 | 32 | 408/749-4091 | 408/774-8812 | 2106 B Scott Street | San Francisco | CA | 94115 |
| Marathe, Amit P. Amit.Marathe@amd.com | INDIA | 024853 | 07541 | 143 | 408/749-4574 | 408/749-5585 | 1307 Edsel Drive | Milpitas | CA | 95035 |
| Sanchez, John E. JohnE.Sanchez@amd.com | USA | 022732 | 07881 | 79 | 408/749-2253 | 408/749-3851 | 857 San Jude Avenue | Palo Alto | CA | 94306 |
| Wang, Fei Fei.Wang@amd.com | USA | 063099 | 07881 | 79 | 408/749-2437 | 408/749-3851 | 6005 Wellfleet Way | San Jose | CA | 95129 |

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TLD ID# _____

Rec'd date _____

California x42110, return to MS68,

Texas x55964 return to MS562,

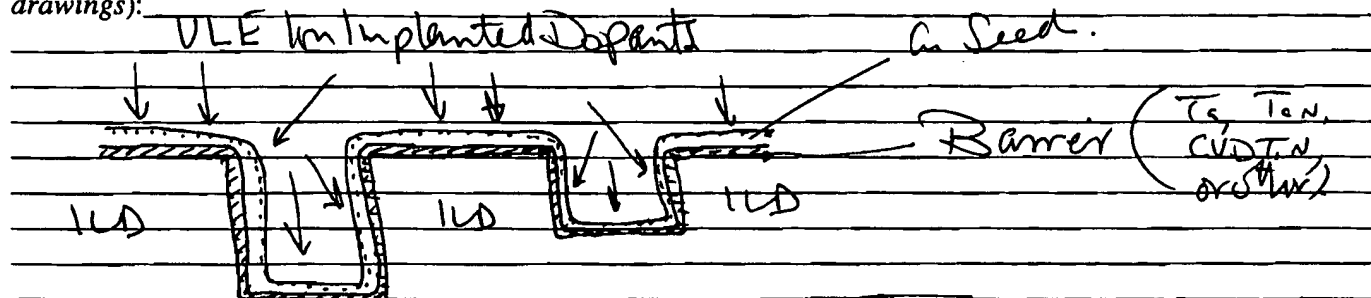
Dresden x83401 Silke Kretzschmar at MS E21-PP.

Identify known relevant art (patents, publications, products):

I am not aware of any that is applicable to the Back End (BE) Processing. ULEIT is used widely in the Front End of line (FEOL) processing for forming SID Ultra (shallow) junctions.

State the problem solved by this invention: ULEIT enables implantation of multiple elements into the seed layer, without the need for manufacture of in-situ targets used in PVD tools.

Brief description and/or sketch of invention (please attach copies of AMD patent notebook pages, reports or drawings):



- Many elements can be implanted without manufacture of solid in-situ targets.
- Alloy/dopant concentration can be controlled and varied with ease.
- Alloy dopant element can be placed @ a very shallow depth without requiring the bulk that is of in lines controlled by the implantation energy.
- The placement of the alloy element dopant on to the sidewalls and bottom of the trench can be controlled by tilting the wafer.

Patent notebook # _____

Page numbers _____

Number of drawings _____

Witness 1 initial: _____

Witness 2 initial: _____

IDFPAPER011 DB 7/31/95 printed Monday, August 20, 2001 4:09 PM

page rev 6/20/00

AMD CONFIDENTIAL

Page 2

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AMD INVENTION DISCLOSURE

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California x42110, return to MS68,

Texas x55964 return to MS562,

Dresden x83401 Silke Kretzschmar at MS E21-PP.

Advantages (check all that apply):

| | | |
|--|--|---|
| <input type="checkbox"/> avoids existing patent(s) | <input type="checkbox"/> improves precision | <input type="checkbox"/> simplifies manufacturing |
| <input type="checkbox"/> new function | <input type="checkbox"/> improves accuracy | <input type="checkbox"/> improves wear characteristic |
| <input type="checkbox"/> improves density | <input type="checkbox"/> improves efficiency | <input type="checkbox"/> improves signal to noise ratio |
| <input type="checkbox"/> increases operating speed | <input type="checkbox"/> fewer component parts | |
| <input type="checkbox"/> improves reliability | <input type="checkbox"/> reduces cost of manufacturing | |

Discussion of advantage of the invention over other solutions

(emphasize technical advance in the art as measured against known art): _____

| | |
|---|--|
| First written description* of invention, date: | First external disclosure to (name): |
| Date of first drawing*: | Date of first external disclosure, none <input type="checkbox"/> |
| Date invention first reduced to practice: | External disclosure under NDA* No <input type="checkbox"/> Yes <input type="checkbox"/> |
| Made by (name): | First external disclosure or use by: presentation <input type="checkbox"/> , |
| Tested by (name): | announcement <input type="checkbox"/> , sample <input type="checkbox"/> , sale <input type="checkbox"/> , other <input type="checkbox"/> |
| Date of first computer simulation: | Date of Non-Disclosure Agreement*, if any: |
| Date of first successful test: | Date of first publication*: |
| any of above occurred outside of USA <input type="checkbox"/> | Publication name: |
| * attach copy if possible | Date of first commercial use: |

Does plan exist to publish, disclose or sell? If so, where and when? _____

Was invention conceived, constructed or tested pursuant to the performance under a development contract with another company: No ☐, Yes ☐. If yes, company name _____

If yes, name of AMD business contact and contract no. _____

Was invention jointly developed with participation of inventors from outside AMD: No ☐, Yes ☐.

If yes, Company name _____

I have read and understood this disclosure and read and signed each page of the attachments:

| | |
|----------------------------|-------------------|
| Witness 1 signature: _____ | Date: _____ |
| Printed name: _____ | Employee #: _____ |
| Witness 2 signature: _____ | Date: _____ |
| Printed name: _____ | Employee #: _____ |

~~After completing to this point, deliver to department reviewer, date delivered: _____~~

Witness 1 initial: _____ Witness 2 initial: _____

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Page 3

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AMD INVENTION DISCLOSURE

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Texas x55964 return to MS562,

Dresden x83401 Silke Kretzschmar at MS E21-PP.

DISCLOSURE EVALUATION (Entries from this point on are by the Reviewer)Does this invention add value to the AMD intellectual property portfolio? Yes ☐, No ☐,

Explain: _____

Do you know of any relevant art? Yes ☐, No ☐, If yes, attach a copy and explain: _____

What application(s) do you foresee for this invention? _____

I estimate the Value* of this invention disclosure is A ☐, B ☐, C ☐, D ☐.

* use worksheet "Valuing Invention Disclosures and Patents".

it is ☐, is not ☐ recommended to AMD for U.S. patent application filing,it is ☐, is not ☐ recommended to AMD for foreign patent application filing,it is ☐, is not ☐ recommended to be held as an AMD trade secret,Give this high priority ☐, normal ☐, low priority ☐, in patent application writing.**GUIDELINES AND CONSIDERATIONS FOR FOREIGN FILING DECISION**

Filing foreign patent applications is costly. We should choose to do it only when conditions warrant.

ALL CONDITIONS BELOW MUST APPLY IN ORDER TO INITIATE A FOREIGN FILING:

- Invention is High-Valued (A, B)*, and
- Invention is in our technology path (usage), and
- Invention usage is detectable by inspection of product, and
- Invention is relatively hard to design around, and
- Competitor is operating in the country of interest. (see ca000000.xls tabulation of "Factory Sites outside the USA .)

I recommend filing patent applications in foreign countries checked below:

| | | | | | |
|--------------------------------|----------------------------------|---------------------------------|-------------------------------|---------------------------------|----------------------------------|
| Japan <input type="checkbox"/> | S.Korea <input type="checkbox"/> | Taiwan <input type="checkbox"/> | U.K. <input type="checkbox"/> | France <input type="checkbox"/> | Germany <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Reviewer's signature: _____ Employee #: _____ Date: _____

Reviewer's printed name: _____

If foreign filing is checked, route to Div. VP for signature.

VP or Designate approves foreign filing (signature) _____

Reviewer: Complete this page and send disclosures to TLD for patent application filing.